INDEX

Fishery Bulletin: Vol. 87, No. 1-4

Abalone
  mariculture, 689

Abalone, northern
  transplanting studies, 95

Abalone, pink
  population studies, 313

Abalone, red
  population studies, 313

"Abalone (genus *Haliotis*) mariculture on the North American Pacific coast," by David L. Leighton, 689

"Age and growth of king mackerel, *Scomberomorus cavalla*, from the Atlantic coast of the United States," by Mark R. Collins, David J. Schmidt, C. Wayne Waltz, and James L. Pickney, 49

"Age and growth of red drum, *Sciaenops ocellatus*, from offshore waters of the northern Gulf of Mexico," by Daniel W. Beckman, Charles A. Wilson, and A. Louise Stanley, 17

"Age and growth of the blacktip shark, *Carcharhinus limbatus*, near Tampa Bay, Florida," by Kristie A. Killam and Glenn R. Parsons, 845

"Age determination in larval and juvenile sheepshead, *Archosargus probatocephalus*," by Glenn R. Parsons and Kevin M. Peters, 985

"Ageing and back-calculating growth rates of Pacific herring, *Clupea pallasii*, larvae by reading daily otolith increments," by Erlend Moksness and Vidar Wespestad, 509

Ageing studies
  anchovy, northern, 399
  clupeid, tropical, 76
  drum, red, 17
  herring, Pacific, 509
  mackerel, king, 49
  marlin, Pacific blue, 829
  rockfish, canary, 791
  rockfish, splitnose, 791
  shark, blacktip, 845
  sheepshead, 985
  tropical fishes, 1

"Aggregation of fish through variable diffusivity," by Ashley J. Mullen, 353

Agnello, Richard J., "The economic value of fishing success: an application of socioeconomic survey data," 223

Alvariño, A.—see Owen et al.

Anchoa mitchilli—see Anchovy, bay

Anchovy, bay
  feeding habits, 279

Anchovy, Hawaiian
  growth rates, 593

Anchovy, northern
  genetic studies, 653
  growth rates, 645
  mortality rates, 387, 399, 457, 673

Anchovy, Peruvian
  mortality rates, 497

Aprion virescens—see Snapper, deep-water; Snapper, uku

Archosargus probatocephalus—see Sheepshead

Argopecten irradians—see Scallops, bay

Atherinopsis californiensis—see Jacksmelt

Atlantic Coast, mid-eastern U.S.
  weakfish fishery, 205

Atlantic Coast, northeast U.S.
  catch estimation, 418

Atlantic Coast, southeastern U.S.
  bay scallop fishery, 189
  bluefin tuna fishery, 615
  crab fishery, 197
  crustacean fishery, 155
  tilefish fishery, 177
  whitebone porgy food habits, 935

Atlantic Ocean, western north
  longbill spearfish fishery, 982

Atractoscion nobilis—see Seabass, white

Atypopenaeus formosus—see Prawns, penaeid

Australia
  blue grenadier fishery, 29
  tropical clupeid fishery, 73

Australian coast, southwestern
  devilfish growth studies, 889

Australian sampling program
  tuna larvae, 976

Baba, Keiji—see Williams and Baba

Bailey, Kevin, "Description and surface distribution of juvenile Peruvian jack mackerel, *Trachurus murphyi*, Nichols from the Subtropical Convergence Zone of the central South Pacific," 273

Bailey, Kevin M.—see Yamashita and Bailey

Balaenoptera physalus—see Whale, fin

Barshaw, Diana E., "Growth and survival of early juvenile American lobsters, *Homarus americanus*, on a diet of plankton," 366

Barsy, W. J.—see Pearcy et al.

Bass, black sea
feeding habits, 279

Bass, kelp
food habits, 569

Bass, sand
food habits, 569

Beamish, Mair T.—see Jackson et al.

Beckman, Daniel W., Charles A. Wilson, and A. Louise Stanley, "Age and growth of red drum, *Sciaenops ocellatus*, from offshore waters of the northern Gulf of Mexico," 17

"Behavioral observations on fin whale, *Balaenoptera physalus*, in the presence of killer whale, *Orcinus orca*," by Omar Vidal and Gary Pechter, 370

Behavioral studies
diffusion model, 353
entanglement of seals, 86
fin whale, 370
killer whale, 370
larvae, 471
larval fishes, 440
penaeid shrimp, 295
salmon, chum, 553
salmon, coho, 769
salmonids, 788
seabass, white

Bering Sea, eastern
crab fishery, 807

Bibliography
Lasker, Reuben, 383

Billfish—see Marlin, Pacific blue

Biomass
zooplankton, 967

"Biomasses of euphausiids and smaller zooplankton in the California Current—Geographic and interannual comparisons relative to the Pacific whiting, *Merluccius productus*, fishery," by M. M. Mullin and A. Conversi, 633

"Bluefin tuna, *Thunnus thynnus*, larvae in the Gulf Stream off the southeastern United States: satellite and shipboard observations of their environment," by Michael F. McGowan and William J. Richards, 615

Bluefish
economic value, 223

Boehlert, George W., Mary M. Yoklavich, and Dudley B. Chelton, "Time series of growth in the genus *Sebastes* from the northeast Pacific Ocean," 791

Bongo net
zooplankton studies, 967

Brachyura: Calappidae—see Crab, box

Brannon, E. L.—see Quinn et al.

Breen, Paul A.—see Tegner et al.

British Columbia
abalone fishery, 95

Brown, Joseph A.—see Chambers et al.

Bruce, B. D.—see Thresher et al.

Buroker, Norman E.—see Crawford et al.

Butler, J. L.—see Owen et al.

Butler, John L., "Growth during the larval and juvenile stages of the northern anchovy, *Engraulis mordax*, in the California Current during 1980-84," 645

Cabezon
spawning, 145

Caillet, Gregor M.—see Hill et al.

Calamus leucosteus—see Porgy, whitebone

California, Southern Bight
larvae feeding habits, 569
northern anchovy fishery, 674

California Coast
kyphosid fishes, 645

California Coast, southern
abalone fishery, 313

California Current
anchovy fishery, 645
zooplankton biomasses, 633

California Current, southern
zooplankton biomass, 967

Callinectes sapidus—see Crab, blue

Callorhinus ursinus—see Seal, northern fur

Cannabalism—see Mortality rates

Capelin
eggs, 515

Carcharhinus limbatus—see Shark, blacktip

Carcinus maenas—see Crab, green

Castro, Refugio G.—see Sheridan et al.

"Catch efficiencies of purse and beach seines in Ivory Coast lagoons," by Emmanuel Charles-Dominique, 911

Catch estimation
diurnal effects, 417
net effects, 447
tuna, yellowfin, 124

Catch rates
beach seine, 911
purse seine, 911
saury, Pacific, 601
spearfish, longbill, 982

"Catchability, growth, and mortality of larval fishes," by Wallace W. Morse, 417

Centropristis striata striata—see Bass, black sea

Cephalopod, tropical
growth studies, 265

Cephalopoda: Loliginidae—see Squid

Chambers, R. Christopher, William C. Leggett, Joseph A. Brown, "Egg size, female effects, and the correlations between early life history traits of capelin, *Mallotus villosus*: an appraisal at the individual level," 515

Charles-Dominique, Emmanuel, "Catch efficiencies of purse and beach seines in Ivory Coast lagoons," 911

Chelton, Dudley B.—see Boehlert et al.

Child, C. Allan—see Williams and Child

Chimaera sp.—see Chimaeriformes

Chimaeriformes
otoliths, 923

Chionoecetes apilio—see Crab, snow

Chionoecetes bairdi—see Crab, snow

Clarke, Thomas A., "Seasonal differences in spawning, egg size, and early development time of the Hawaiian anchovy or nehu, *Encrasicholina purpurea*," 593

Clupea pallasii—see Herring, Pacific

Clupeid, tropical
larval development, 73

Cobbler, South Australian—see Devilfish, Australian

Cod, Pacific
food habits, 807

Collins, Mark R., David J. Schmidt, C. Wayne Waltz, and James L. Pickney, "Age and growth of king mackerel, *Scomberomorus cavalla*, from the Atlantic coast of the United States," 49

Cololabis saira—see Saury, Pacific

Columbia River, Hanford Reach
salmonid population studies, 776

"A comparative analysis of growth zones in four calcified structures of Pacific blue marlin, *Makaira nigricans*," by Kevin T. Hill, Gregor M. Caillet, and Richard L. Radtke, 829

"Comparative growth, mortality, and energetics of marine fish larvae: temperature and implied latitudinal effects," by Edward D. Houde, 471

"Comparative standing stocks of mesozooplankton and macrozooplankton in the southern sector of the California current system," by M. D. Ohman and J. R. Wilkinson, 967

"Comparison of some genera and species of box crabs (Brachyura: Calappidae), southwestern North Atlantic, with description of a new genus and species," by Austin B. Williams and C. Allan Child, 105

Conley, Walter J.—see Gartner et al.

Conversi, A.—see Mullin and Conversi

Costa, Daniel P.—see Feldkamp et al.

Costa Rica fishery
mortality rates, 363

Cottoid bubblemorph, 735

Crab, blue
food habits, 197

Crab, box
morphology, 105

Crab, green
food habits, 197

Crab, lady
food habits, 197

Crab, mud
food habits, 197

Crab, red king
mortality rates, 807

Crab, snow
mortality rates, 807

Crab, spider
food habits, 197

Crabs—see also Crustaceans

Crawford, Maurice K., Churchill B. Grimes, and Norman E. Buroker, "Stock identification of weakfish, *Cynoscion regalis*, in the Middle Atlantic region," 205

Croaker, white
food habits, 569

Crustaceans
seasonal effects, 155

Cynoscion regalis—see Weakfish

Dauble, Dennis D., Thomas L. Page, and R. William Hanf, Jr., "Spatial distribution of juvenile salmonids in the Hanford Reach, Columbia River," 775

Davis, Raymond L., Jr.—see Watson and Davis

Davis, Tim L. O., Greg P. Jenkins, Mori Yukinawa, and Yasuo Nishikawa, "Tuna larvae abundance: comparative estimates from concurrent Japanese and Australian sampling programs," 976

"Description and surface distribution of juvenile Peruvian jack mackerel, *Trachurus murphyi*, Nichols from the Subtropical Convergence Zone of the central South Pacific," by Kevin Bailey, 273

"Development and distribution of larvae and pelagic juveniles of three kyphosid fishes (*Girella nigricans*, *Medialuna californiensis* and *Hermosilla azurea*) off California and Baja California," by Elizabeth G. Stevens, William Watson, and H. Geoffrey Moser, 745

Devilfish, Australian
growth studies, 889

DeVrey, Gregory K.—see Feldkamp et al.

Diet—see also Food habits
cod, Pacific, 807
Pacific Coast fish, 569
porgy, whitebone, 935
snapper, deep-water, 1001

Diffusion model, 353

"Digestive-gland histology in paralarval squids (Cephalopoda: Loliginidoe)," by Michael Vecchione and Victoria A. Hand, 995

"Distribution, advection, and growth of larvae of the southern temperate gadoid, *Macruronus novaezelandiae* (Teleostei: Merlucciidae), in Australian coastal waters," by R. E. Thresher, B. D. Bruce, D. M. Furlani, and J. S. Gunn, 29

Dittman, A. H.—see Quinn et al.

Diurnal effects
larval fishes, 417

Dolphin
school abundance, 859

Drum, red
ageing studies, 17

"The economic value of fishing success: an application of socioeconomic survey data," by Richard J. Agnello, 223

Edwards, Elizabeth F., and Pierre M. Kleiber, "Effects of nonrandomness on line transect estimates of dolphin school abundance," 859

Eelgrass
transplantation, 189

"Effects of food concentration and temperature on development, growth, and survival of white perch, *Morone americana*, eggs and larvae," by Daniel Margulies, 63

"Effects of nonrandomness on line transect estimates of dolphin school abundance," by Elizabeth F. Edwards and Pierre M. Kleiber, 859

Egg production
anchovy, Peruvian, 497
sardine, Pacific, 497

"Egg size, female effects, and the correlations between early life history traits of capelin, *Mallotus villosus*: an appraisal at the individual level," by R.

Christopher Chambers, William C. Leggett, Joseph A. Brown, 515

Eggs
anchovy, Hawaiian, 593
capelin, 515

El Niño—see California Current

Emmett, B., and G. S. Jamieson, "An experimental transplant of northern abalone, *Haliotis kamtschatkana*, in Barkley Sound, British Columbia," 95

Encrasicholina purpurea—see Anchovy, Hawaiian

"Energetic and behavioral effects of net entanglement on juvenile northern fur seals, *Callorhinus ursinus*," by Steven D. Feldkamp, Daniel P. Costa, and Gregory K. DeVrey, 85

Energetics—see Behavioral studies

"Energy utilization in bay anchovy, *Anchoa mitchilli*, and black sea bass, *Centropristis striata striata*, eggs and larvae," by John Tucker, Jr., 279

Engraulis mordax—see Anchovy, northern

Engraulis ringens—see Anchovy, Peruvian

Entanglement
seal, northern fur, 87

Environmental studies—see Habitat effects

"An eponym for Reuben Lasker," by Daniel Pauly, 383

"Escapement by fishes from midwater trawls: a case study using lanternfishes (Pisces: Myctophidae)," by John V. Gartner, Jr., Walter J. Conley, and Thomas L. Hopkins, 213

"Estimating some early life history parameters in a tropical clupeid, *Herklotsichthys castelnaui*, from daily growth increments in otoliths," by Simon R. Thorrold, 73

Etelis coruscans—see Snapper, onaga

Euphausiids
biomasses, 633

Everson, Alan R., Happy A. Williams, and Bernard M. Ito, "Maturation and reproduction in two Hawaiian eteline snappers, uku, *Aprion virescens*, and onaga, *Etelis coruscans*," 877

"An experimental transplant of northern abalone, *Haliotis kamtschatkana*, in Barkley Sound, British Columbia," by B. Emmett and G. S. Jamieson, 95

"Factors influencing recapture patterns of tagged penaeid shrimp in the western Gulf of Mexico," by Peter F. Sheridan, Refugio G. Castro, Frank J. Patella, Jr., and Gilbert Zamora, Jr., 295

Fecundity—see Reproductive studies

Feeding—see Food habits

"Feeding habits of whitebone porgy, *Calamus leucosteus* (Teleostei:Sparidae), associated with hard bottom reefs off the southeastern United States," by George R. Sedberry, 935

Feldkamp, Steven D., Daniel P. Costa, and Gregory K. DeKrey, "Energetic and behavioral effects of net entanglement on juvenile northern fur seals, *Callorhinus ursinus*," 85

Female effects
capelin eggs, 515

Festschrift, Reuben Lasker, 376

Fish, larval
catch estimation, 417

Fisheries management, 223

Fishery management
abalone, 313

Fishery, yellowfin tuna
Pacific Ocean, western, 123

Fishes, kyphosid
larvae, 745

Fishes, sciaenid
mortality rates, 363

Flounder, summer
economic value, 223

Fonseca, Mark S.—see Smith et al.

Food habits
anchovy, bay, 284
anchovy, northern, 457, 682
bass, black sea, 284
cod, Pacific, 807
crab, 197
lobster, American, 366
porgy, whitebone, 935
squid, 995

"Food habits and algal associations of juvenile lumpfish, *Cyclopterus lumpus* L., in intertidal waters," by John R. Moring, 233

"Food habits of five crab species at Pettaquamscutt River, Rhode Island," by John W. Ropes, 197

Furlani, D. M.—see Thresher et al.

Gadus macrocephalus—see Cod, Pacific

Garita, Juan—see Szelistowski et al.

Gartner, John V., Jr., Walter J. Conley, and Thomas L. Hopkins, "Escapement by fishes from midwater trawls: a case study using lanternfishes (Pisces: Myctophidae)," 213

Gauldie, R. W.—see Mulligan et al.

"Genetic and morphometric variation in the Pacific sardine, *Sardinops sagax caerulea*: comparisons and contrasts with historical data and with variability in the northern anchovy, *Engraulis mordax*," by Dennis Hedgecock, Elmarie S. Hutchinson, Gang Li, Frederick L. Sly, and Keith Nelson, 653

"Genetic population structure of chinook salmon, *Oncorhynchus tshawytscha*, in the Pacific Northwest," by F. Utter, G. Milner, G. Stahl, and D. Teel, 239

Genetic studies
  anchovy, northern, 653
  sardine, Pacific, 653

Genyonemus lineatus—see Croaker, white

Geographic range
  crab, box, 105

Girella nigricans—see Fishes, kyphosid

Grenadier, blue
  larval development, 29

Grimes, Churchill B.—see Crawford et al.

Grossman, Gary D.—see Hightower and Grossman

"Growth and survival of early juvenile American lobsters, *Homarus americanus*, on a diet of plankton," by Diana E. Barshaw, 366

"Growth during the larval and juvenile stages of the northern anchovy, *Engraulis mordax*, in the California Current during 1980-84," by John L. Butler, 645

Growth rates
  anchovy, Hawaiian, 593
  anchovy, northern, 645
  herring, Pacific, 509
  larvae, 471
  pollock, walleye, 525
  seabass, white, 537

Growth studies
  abalone, northern, 99
  anchovy, northern, 460
  blue grenadier larvae, 29
  devilfish, Australian, 889
  drum, red, 19
  larval fishes, 417
  lobster, American, 366
  mackerel, king, 50
  marlin, Pacific blue, 829
  rockfish, canary, 791
  rockfish, splitnose, 791
  shark, blacktip, 845
  snapper, gindai, 8
  snapper, onaga, 877
  snapper, uku, 877
  tropical clupeid larvae, 78
  white perch larvae, 65

Grunion
  food habits, 569

Gulf of Maine, central and eastern
  megafauna, 935

Gulf of Mexico
  bluefin tuna fishery, 615
  whitebone porgy food habits, 935

Gulf of Mexico, northern
  red drum fishery, 17

Gulf of Mexico, western
  shrimp fishery, 295

Gulf Stream temperatures, 617

Gunn, J. S.—see Thresher et al.

Gymnapistes marmoratus—see Devilfish, Australian

Habitat effects
  anchovy, northern, 673
  snapper, deep-water, 1001
  temperature and latitude, 471
  wind conditions on anchovy larvae, 387
  zooplankton biomasses, 633

Habitat enhancement, marine
  transplanted eelgrass, 189

Habitat studies
  hard bottom reefs, 935

"Habitat value of natural versus recently transplanted eelgrass, *Zostera marina*, for the bay scallop, *Argopecten irradians*," by Ingrid Smith, Mark S. Fonseca, Jose A. Rivera, and Keith A. Rittmaster, 189

Habitats
  tuna, bluefin, 615

Halibut, California
food habits, 569

Haliotis corrungata—see Abalone, pink

Haliotis rufescens—see Abalone, red

Halitosis kamtschatkana—see Abalone, northern

Hand, Victoria A.—see Vecchione and Hand

Hanf, R. William, Jr.—see Dauble et al.

Hard bottom reefs
whitebone porgy food habits, 935

Harriotta raleighana—see Chimaeriformes

Hastie, James—see Squires et al.

Hatchery studies
chinook salmon, 251

Hawaiian Islands, penguin bank region
snapper fishery, 877

Hawaiian Islands coasts, eastern
deep-water snapper habitat, 1001

Hedgecock, Dennis, Elmarie S. Hutchinson, Gang Li, Frederick L. Sly, and Keith Nelson, "Genetic and morphometric variation in the Pacific sardine, *Sardinops sagax caerulea*: comparison and contrasts with historical data and with variability in the northern anchovy, *Engraulis mordax*," 653

Herklotsichthys castelnaui—see Clupeid, tropical

Hermosilla azurea—see Fishes, kyphosid

Herrick, Samuel F., Jr.—see Squires et al.

Herring, Pacific
growth rates, 509

Hewitt, Roger P.—see Lo et al.

Hightower, Joseph E., and Gary D. Grossman, "Status of the tilefish, *Lopholatilus chamaeleonticeps*, fishery off South Carolina and Georgia and recommendations for management," 177

Hill, Kevin T., Gregor M. Caillet, and Richard L. Radtke, "A comparative analysis of growth zones in four calcified structures of Pacific blue marlin, *Makaira nigricans*," 829

Hixon, M. A.—see Pearcy et al.

Hoki—see Grenadier, blue

Homarus americanus—see Lobster, American

Hopkins, Thomas L.—see Gartner et al.

Houde, Edward D., "Comparative growth, mortality, and energetics of marine fish larvae: temperature and implied latitudinal effects," 471

Hunter, J. R.—see Owen et al.

Hunter, John R.—see Lo et al.

Hutchings, Larry—see Shelton and Hutchings

Hutchinson, Elmarie S.—see Hedgecock et al.

Hydrolagus novaezelandiae—see Chimaeriformes

"Identification of habitat of juvenile snappers in Hawaii," by Frank A. Parrish, 1001

Idiosepius pygmaeus—see Cephalopod, tropical

"Integration of Japanese and United States sablefish markets," by Dale Squires, Samuel F. Herrick, Jr., and James Hastie, 341

Interaction—see Behavioral studies

"Interannual trends in Pacific cod, *Gadus macrocephalus*, predation on three commercially important crab species in the eastern Bering Sea," by Patricia A. Livingston, 807

Ivory Coast lagoons
catch efficiency, seine nets, 911

Jacksmelt
food habits, 569

Jackson, Christopher J., Peter C. Rothlisberg, Robert C. Pendrey, and Mair T. Beamish, "A key to genera of the penaeid larvae and early postlarvae of the Indo-west Pacific region, with descriptions of the larval development of *Atypopenaeus formosus* Dall and *Metape naeopsis palmensis* Maxwell (Decapoda: Penaeoidea: Penacidae) reared in the laboratory," 703

Jamieson, G. S.—see Emmett and Jamieson

Japanese markets
sablefish, 341

Japanese sampling program
tuna larvae, 976

Jenkins, Greg P.—see Davis et al.

"A key to genera of the penaeid larvae and early postlarvae of the Indo-west Pacific region, with descriptions of the larval development of *Atypopenaeus formosus* Dall and *Metape naeopsis palmensis* Maxwell (Decapoda: Penaeoidea:

Penaeidae) reared in the laboratory," by Christopher J. Jackson, Peter C. Rothlisberg, Robert C. Pendrey, and Mair T. Beamish, 703

Killam, Kristie A., and Glenn R. Parsons, "Age and growth of the blacktip shark, *Carcharhinus limbatus*, near Tampa Bay, Florida," 845

Kleiber, Pierre M.—see Edwards and Kleiber

Kobayashi, Donald R.—see Somerton and Kobayashi

"A laboratory study of the bioenergetics of larval walleye pollock, *Theragra chalcogramma*," by Yoh Yamashita and Kevin M. Bailey, 525

Langton, Richard W., and Joseph R. Uzmann, "A photographic survey of the megafauna of the central and eastern Gulf of Maine," 945

Lanternfish
mortality studies, 213

Larvae
anchovy, bay 279
anchovy, northern, 387, 399, 645, 673
black sea bass, 279
catch estimation, 447
clupeid, tropical, 75
devilfish, Australian, 889
diets, 569
fishes, kyphosid, 745
grenadier, blue, 29
herring, Pacific, 509
mortality rates, 417, 471
perch, white, 65
pollock, walleye, 525
prawns, penaeid, 703
saury, Pacific, 601
seabass, white
sheepshead, 986
snailfish, slipskin, 735
snailfish, spotted, 735
squid, 995
tuna, 976
tuna, bluefin, 615

"Larvae of *Liparis fucensis* and *Liparis callyodon*: Is the 'cottoid bubblemorph' phylogenetically significant?," by Jeffrey B. Marliave and Alex E. Peden, 735

"Larval development of the Australian devilfish, *Gymnapistes marmoratus* (Teleostei: Scorpaenidae)," by Francisco J. Neira, 889

"Larval fish diets in shallow coastal waters off San Onofre, California," by William Watson and Raymond L. Davis, Jr., 569

"Larval production and mortality of saury (*Coloabis saira*) in the northwestern Pacific Ocean," by Yoshiro Watanabe and Nancy C. H. Lo, 601

Lasker, Reuben
memorial, 376

Lauth, Robert R., "Seasonal spawning cycle, spawning frequency, and batch fecundity of the cabezon, *Scorpaenichthys marmoratus*, in Puget Sound, Washington," 145

Leggett, William C.—see Chambers et al.

Leighton, David L., "Abalone (genus *Haliotis*) mariculture on the North American Pacific coast," 689

Lennert, Cleridy E.—see Tegner et al.

Leuresthes tenuis—see Grunion

Li, Gang—see Hedgecock et al.

Libinia emarginata—see Crab, spider

Life history traits
capelin, 515

Liparis callyodin—see Snailfish, spotted

Liparis fucensis—see Snailfish, slipskin

Livingston, Patricia A., "Interannual trends in Pacific cod, *Gadus macrocephalus*, predation on three commercially important crab species in the eastern Bering Sea," 807

Lo, N. C. H.—see Owen et al.

Lo, Nancy C. H., John R. Hunter, and Roger P. Hewitt, "Precision and bias of estimates of larval mortality," 399

Lo, Nancy C. H.—see Watanabe and Lo

Lobster, American
growth studies, 366

Lobster, squat
morphology, 899

"Longbill spearfish, *Tetrapturus pfluegeri*, incidentally caught by recreational billfishermen in the western north Atlantic Ocean, 1974-86," by W. N. Witzell, 982

Longline, catch rates
tuna, yellowfin, 136

Lopholatilus chamaeleonticeps—see Tilefish

Mackerel, jack
population studies, 273

Mackerel, king
ageing studies, 49

Macrozooplankton—see Zooplankton

Macruronus novaezelandiae—see Grenadier, blue

Makaira nigricans—see Marlin, Pacific blue

Mallotus villosus—see Capelin

Management—see Fisheries management

Margulies, Daniel, "Effects of food concentration and temperature on development, growth, and survival of white perch, *Morone americana*, eggs and larvae," 63

Margulies, Daniel, "Size-specific vulnerability to predation and sensory system development of white seabass, *Atractoscion nobilis*, larvae," 537

Mariculture
abalone, 689

Marketing
sablefish, 341

Marliave, Jeffrey B., and Alex E. Peden, "Larvae of *Liparis fucensis* and *Liparis callyodon*: Is the 'cottoid bubblemorph' phylogenetically significant?," 735

Marlin, Pacific blue
growth studies, 829

"Mass mortality of sciaenid fishes in the Gulf of Nicoya, Costa Rica," by William A. Szelistowski and Juan Garita, 363

Mathematical techniques
biomass calculations, 343
catch estimation
diffusion model, 353
dolphin school abundance, 859
modeling wind conditions, 387
mortality rates, 400

"Maturation and reproduction in two Hawaiian eteline snappers, uku, *Aprion virescens*, and onaga, *Etelis coruscans*," by Alan R. Everson, Happy A. Williams, and Bernard M. Ito, 877

McGowan, Michael F., and William J. Richards, "Bluefin tuna, *Thunnus thynnus*, larvae in the Gulf Stream off the southeastern United States: satellite and shipboard observations of their environment," 615

Medialuna californiensis—see Fishes, kyphosid

Megafauna
Gulf of Maine, 945

Mellor, George L.—see Wroblewski et al.

Memorial issue, Reuben Lasker, 376

Merluccius productus—see Whiting, Pacific

Metabolism
larvae, 473
pollock, walleye, 527

Metapenaeopsis palmensis—see Prawns, Penaeid

"A method for correcting catches of fish larvae for the size selection of plankton nets," by David A. Somerton and Donald R. Kobayashi, 447

Mezozooplankton—see Zooplankton

Microstomus pacificus—see Sole, Dover

"Midgut cell height defines nutritional status of laboratory raised larval northern anchovy, *Engraulis mordax*," by Gail H. Theilacker and Yoshiro Watanabe, 457

Migration—see also Movement patterns
chum salmon, 553
coho salmon, 769
salmonids, 775

Milner, G.—see Utter et al.

Modeling, mathematical—see Mathematical techniques

Moksness, Erlend, and Vidar Wespestad, "Ageing and back-calculating growth rates of Pacific herring, *Clupea pallasii*, larvae by reading daily otolith increments," 509

Moring, John R., "Food habits and algal associations of juvenile lumpfish, *Cyclopterus lumpus* L., in intertidal waters," 233

Morone americana—see Perch, white

Morphology
crab, box, 105
lobster, squat, 899
prawns, penaeid, 703
snailfish, 735

Morse, Wallace W., "Catchability, growth, and mortality of larval fishes," 417

Mortality rate
abalone, 326

anchovy, northern, 387, 406
anchovy, Peruvian, 497
capelin, 517
crab, 197
crab, red king, 807
crab, snow, 807
larvae, 471
larval fishes, 417
lobster, American, 366
perch, white, 69
sardine, Pacific, 497
saury, Pacific, 601
sciaenid fishes, 363
seabass, white, 537
seal, northern fur, 91

Mortality studies
lanternfish, 213
squid, 995

Moser, H. Geoffrey—see Stevens et al.

Movement patterns
penaeid shrimp, 295

Mullen, Ashley J., "Aggregation of fish through variable diffusivity," 353

Mulligan, K. P., R. W. Gauldie, and R. Thomson, "Otoconia from four New Zealand chimaeraformes," 923

Mullin, M. M., and A. Conversi, "Biomasses of euphausiids and smaller zooplankton in the California Current—Geographic and interannual comparisons relative to the Pacific whiting, *Merluccius productus*, fishery," 633

Munidopsis granosicorium—see Lobster, squat

Munidopsis lignaria—see Lobster, squat

Munidopsis marianica—see Lobster, squat

Nehu—see Anchovy, Hawaiian

Neira, Francisco J., "Larval development of the Australian devilfish, *Gymnapistes marmoratus* (Teleostei: Scorpaenidae)," 889

Nelson, Keith—see Hedgecock et al.

Neopanopeus texana—see Crab, mud

Nets
beach seines, 911
entanglement of seals, 85
plankton catch estimation, 447
purse seines, 911

Nets, trawl
escapement of midwater fishes, 213

New Zealand waters
deep-water chimaeras, 923

"New squat lobsters (Galatheidae) from the Pacific Ocean: Mariana Back Arc Basin, East Pacific Rise, and Cascadia Basin," by Austin B. Williams and Keiji Baba, 899

Nishikawa, Yasuo—see Davis et al.

"Numerical integration of daily growth increments: an efficient means of ageing tropical fishes for stock assessment," by Stephen Ralston and Happy A. Williams, 1

Nutrition effects—see Food habits

Ohman, M. D., and J. R. Wilkinson, "Comparative standing stocks of mesozooplankton and macrozooplankton in the southern sector of California current system," 967

Oncorhynchus keta—see Salmon, chum

Oncorhynchus kisutch—see Salmon, coho

Oncorhynchus mykiss—see Steelhead

Oncorhynchus nerka—see Salmon, sockeye

Oncorhynchus tshawytscha—see Salmon, chinook

"Optimal wind conditions for the survival of larval northern anchovy, *Engraulis mordax*: a modeling investigation," by J. S. Wroblewski, James G. Richman, and George L. Mellor, 387

Orcinus orca—see Whale, killer

Oregon Coast
chum salmon fishery, 554

Oregon Coast, central
population studies, 955

Oregon Coast, northern
Dover sole fishery, 988

"Otoconia from four New Zealand chimaeraformes," by K. P. Mulligan, R. W. Gauldie, and R. Thomson, 923

Otoliths—see also Statolith
chimaeriformes, 923
clupeid, tropical, 73
herring, Pacific, 509
rockfish, canary, 791
rockfish, splitnose, 791
sheepshead, 986
snapper, gindai, 2

Ovalipes ocellatus—see Crab, lady

Owen, R. W., N. C. H. Lo, J. L. Butler, G. H. Theilacker, A. Alvariño, J. R. Hunter, and Y. Watanabe, "Spawning and survival patterns of larval northern anchovy, *Engraulis mordax*, in contrasting environments—a site-intensive study," 673

Pacific Coast, northeast
anchovy fishery, 654
chinook salmon fishery, 239
rockfish fishery, 791
sardine fishery, 654

Pacific Coast, U.S.
abalone mariculture, 689

Pacific Ocean, central south
jack mackerel fishery, 273

Pacific Ocean, northwestern
Pacific saury fishery, 601

Pacific Ocean, western
catch rates of yellowfin tuna, 123
squat lobster morphology, 899

Page, Thomas L.—see Dauble et al.

Paralabrax spp.—see Bass, kelp and sand

Paralichthys californicus—see Halibut, California

Paralichthys dentatus—see Flounder, summer

Paralithodes camtschatica—see Crab, red king

Parrish, Frank A., "Identification of habitat of juvenile snappers in Hawaii," 1001

Parsons, Glenn R. and Kevin M. Peters, "Age determination in larval and juvenile sheepshead, *Archosargus probatocephalus*," 985

Parsons, Glenn R.—see Killam and Parsons

Patella, Frank J., Jr.—see Sheridan et al.

Pauly, Daniel, "An eponym for Reuben Lasker," 383

Pearcy, W. G., D. L. Stein, M. A. Hixon, E. K. Pikitch, W. H. Barsy, and R. M. Starr, "Submersible observations of deep-reef fishes of Heceta Bank, Oregon," 955

Pechter, Gary—see Vidal and Pechter

Peden, Alex E.—see Marliave and Peden

Penaeus aztecus—see Shrimp, brown

Penaeus duorarum—see Shrimp, pink

Pendrey, Robert C.—see Jackson et al.

Perch, white
growth studies, 63

Peruvian Coast
anchovy fishery, 497
sardine fishery, 497

Peters, Kevin M.—see Parsons and Peters

"A photographic survey of the megafauna of the central and eastern Gulf of Maine," by Richard W. Langton and Joseph R. Uzmann, 945

Pickney, J. L.—see Collins et al.

Pikitch, E. K.—see Pearcy et al.

Pikitch, Ellen K.—see Yoklavich and Pikitch

Pisces: Myctophidae—see Lanternfish

Plankton nets—see Nets

Plankton studies, 29

Polacheck, Tom, "Yellowfin tuna, *Thunnus albacares*, catch rates in the western Pacific," 123

Pollock, walleye
growth rates, 525

Pomatomus saltatrix—see Bluefish

"Population biology of red abalones, *Haliotis rufescens*, in southern California and management of the red and pink, *H. corrugata*, abalone fisheries," by Mia J. Tegner, Paul A. Breen, and Cleridy E. Lennert, 313

Population studies, 35
abalone, 313
anchovy, northern, 653
crustaceans, 155
deep-reef fishes, 955
dolphin, 859
fishes, kyphosid, 645
mackerel, jack, 273
megafauna in Gulf of Maine, 945
research, 377
salmon, chinook, 239
salmon, chum, 553
salmonids, 775
sardine, Pacific, 653
snapper, gindai, 10
sole, Dover, 990
spearfish, longbill, 982
tilefish, 177
tuna larvae, 976
weakfish, 205
zooplankton, 967

Porgy, whitebone
food habits, 935

Prawns, penaeid
taxonomic key, 703

"Precision and bias of estimates of larval mortality," by Nancy C. H. Lo, John R. Hunter, and Roger P. Hewitt, 399

Predation—see Mortality rate

Predatory behavior—see Behavioral studies

Pricing—see Marketing

Pristipomoides filamentosus—see Snapper, deep-water

Pristipomoides zonatus—see Snapper, gindai

Puget Sound
cabezon fishery, 145

Purse seine catch rates
tuna, yellowfin, 136

Queenfish
food and habits, 569

Quinn, T. P., E. L. Brannon, and A. H. Dittman, "Spatial aspects of imprinting and homing in coho salmon, *Oncorhynchus kisutch*," 769

Radtke, Richard L.—see Hill et al.

Ralston, Stephen, and Happy A. Williams, "Numerical integration of daily growth increments: an efficient means of ageing tropical fishes for stock assessment," 1

Range—see Geographic range

Recreational fisheries, marine
economic value, 223

"Reproductive status of dover sole, *Microstomus pacificus*, off northern Oregon," by Mary M. Yoklavich and Ellen K. Pikitch, 988

Reproductive studies
cabezon, 145
sole, Dover, 988

Reuben Lasker: A remembrance 1929-1988," by Lillian L. Vlymen, 376

Rhinochimaera sp.—see Chimaeriformes

Richards, William J.—see McGowan and Richards

Richman, James G.—see Wroblewski et al.

Rittmaster, Keith A.—see Smith et al.

Rivera, Jose A.—see Smith et al.

Rockfish
population studies, 955

Rockfish, canary
growth studies, 791

Rockfish, splitnose
growth studies, 791

Ropes, John W., "The food habits of five crab species at Pettaquamscutt River, Rhode Island," 197

Rothlisberg, Peter C.—see Jackson et al.

Sablefish
marketing, 341

Salmon, chinook
population studies, 239, 775

Salmon, chum
population studies, 553

Salmon, coho
behavior studies, 769

Salmon, sockeye
population studies, 775

Sampling methods
dolphin school abundance, 859
mortality rates, 404
tuna larvae, 976

Sardine, Pacific
genetic studies, 653
mortality rates, 497

Sardinops sagax—see Sardine, Pacific

Sardinops sagax caerulea—see Sardine, Pacific

Satellite
Gulf Stream temperature measurement, 615

Saury, Pacific
mortality rates, 601

Scallops, bay
habitat, 189

Schmidt, David J.—see Collins et al.

School abundance
dolphin, 859

Sciaenops ocellatus—see Drum, red

Scomberomorus cavalla—see Mackerel, king

Scorpaenichthys marmoratus—see Cabezon

Seabass, white
mortality rates, 537

Seal, northern fur
net entanglement, 85

"Seasonal composition and abundance of decapod and stomatopod crustaceans from coastal habitats, southeastern United States," by Elizabeth L. Wenner and Charles A. Wenner, 155

"Seasonal differences in spawning, egg size, and early development time of the Hawaiian anchovy or nehu, *Encrasicholina purpurea*," by Thomas A. Clarke, 593

Seasonal effects
anchovy, Hawaiian, 593
cabezon, 145
crustaceans, 155

"Seasonal spawning cycle, spawning frequency, and batch fecundity of the cabezon, *Scorpaenichthys marmoratus*, in Puget Sound, Washington," by Robert R. Lauth, 145

Sebastes diploproa—see Rockfish, splitnose

Sebastes pinniger—see Rockfish, canary

Sebastes spp.—see Rockfish

Sedberry, George R., "Feeding habits of whitebone porgy, *Calamus leucosteus* (Teleostei:Sparidae), associated with hard bottom reefs off the southeastern United States," 935

Sensory development
seabass, white, 547

Seriphus politus—see Queenfish

Shark, blacktip
growth studies, 845

Sheepshead
ageing studies, 985

Sheridan, Peter F., Refugio G. Castro, Frank J. Patella, Jr., and Gilbert Zamora, Jr., "Factors influencing recapture patterns of tagged penaeid shrimp in the western Gulf of Mexico," 295

Shrimp—see also Crustaceans

Shrimp, brown
behavior studies, 295

Shrimp, pink
behavior studies, 295

Simulation
larval mortality, 411

Simulation model
dolphin school abundance, 859

"Size-specific vulnerability to predation and sensory system development of white seabass, *Atractoscion nobilis*, larvae," by Daniel Margulies, 537

Sly, Frederick L.—see Hedgecock et al.

Smith, Ingrid, Mark S. Fonseca, Jose A. Rivera, and Keith A. Rittmaster, "Habitat value of natural versus recently transplanted eelgrass, *Zostera marina*, for the bay scallop, *Argopecten irradians*," 189

Snailfish, slipskin
morphology, 735

Snailfish, spotted
larvae, 735

Snapper, deep-water
habitat effects, 1001

Snapper, gindai
ageing studies, 2

Snapper, onaga
growth studies, 877

Snapper, uku
growth studies, 877

Soldier fish—see Devilfish, Australian

Sole, Dover
reproductive studies, 988

Somerton, David A., and Donald R. Kobayashi, "A method for correcting catches of fish larvae for the size selection of plankton nets," 447

"Spatial aspects of imprinting and homing in coho salmon, *Oncorhynchus kisutch*," by T. P. Quinn, E. L. Brannon, and A. H. Dittman, 769

"Spatial distribution of juvenile salmonids in the Hanford Reach, Columbia River," by Dennis D. Dauble, Thomas L. Page, and R. William Hanf, Jr., 775

Spawning
anchovy, Hawaiian, 593
anchovy, northern, 673
cabezon, 145
capelin, 516

snailfish, 735
snapper, onaga, 879
snapper, uku, 879
tuna, bluefin, 626

"Spawning and survival patterns of larval northern anchovy, *Engraulis mordax*, in contrasting environments—a site-intensive study," by R. W. Owen, N. C. H. Lo, J. L. Butler, G. H. Theilacker, A. Alvarino, J. R. Hunter, and Y. Watanabe, 673

Spearfish, longbill
population studies, 982

Squid
mortality studies, 995

Squires, Dale, Samuel F. Herrick, Jr., and James Hastie, "Integration of Japanese and United States sablefish markets," 341

Stahl, G.—see Utter et al.

Stanley, A. Louise—see Beckman et al.

Starch gel electrophoresis, 205

Starr, R. M.—see Pearcy et al.

Statolith microstructure
tropical cephalopod, 265

"Status of the tilefish, *Lopholatilus chamaeleonticeps*, fishery off South Carolina and Georgia and recommendations for management," by Joseph E. Hightower and Gary D. Grossman, 177

Steelhead
population studies, 775

Stein, D. L.—see Pearcy et al.

Stevens, Elizabeth G., William Watson, and H. Geoffrey Moser, "Development and distribution of larvae and pelagic juveniles of three kyphosid fishes (*Girella nigricans*, *Medialuna californiensis* and *Hermosilla azurea*) off California and Baja California," 745

Stock assessment—see Population studies

"Stock identification of weakfish, *Cynoscion regalis*, in the Middle Atlantic region," by Maurice K. Crawford, Churchill B. Grimes, and Norman E. Buroker, 205

Stock recruitment
tilefish, 181

Submersible
deep-reef fish population studies, 955
photographic survey, 945

"Submersible observations of deep-reef fishes of Heceta Bank, Oregon," by William G. Pearcy, D. L. Stein, M. A. Hixon, E. K. Pikitch, W. H. Barsy, and R. M. Starr, 955

Survival—see Mortality rates

Swan Estuary, Australia
devilfish growth studies, 889

Szelistowski, William A., and Juan Garita, "Mass mortality of sciaenid fishes in the Gulf of Nicoya, Costa Rica," 363

Tampa Bay, Florida
blacktip shark growth studies, 845

Taxonomy
crab, box, 105
prawns, penaeid, 703

Teel, D.—see Utter et al.

Tegner, Mia J., Paul A. Breen, and Cleridy E. Lennert, "Population biology of red abalones, *Haliotis rufescens*, in southern California and management of the red and pink, *H. corrugata*, abalone fisheries," 313

Tetrapturus pfluegeri—see Spearfish, longbill

Theilacker, G. H.—see Owen et al.

Theilacker, Gail H., and Yoshiro Watanabe, "Midgut cell height defines nutritional status of laboratory raised larval northern anchovy, *Engraulis mordax*," 457

Theragra chalcogramma—see Pollock, walleye

Thomson, R.—see Mulligan et al.

Thorrold, Simon R., "Estimating some early life history parameters in a tropical clupeid, *Herklotsichthys castelnaui*, from daily growth increments in otoliths," 73

Thresher, R. E., B. D. Bruce, D. M. Furlani, and J. S. Gunn, "Distribution, advection, and growth of larvae of the southern temperate gadoid, *Macruronus novaezelandiae* (Teleostei: Merlucciidae), in Australian coastal waters," 29

Thunnus alalunga—see Tuna, albacore

Thunnus albacares—see Tuna, yellowfin

Thunnus spp.—see Tuna

Thunnus thynnus—see Tuna, bluefin

Tilefish
population studies, 177

"Time series of growth in the genus *Sebastes* from the northeast Pacific Ocean", by George W. Boehlert, Mary M. Yoklavich, and Dudley B. Chelton, 791

Trachurus murphyi—see Mackerel, jack

Transplantation
abalone, northern, 97

Trawl nets—see Nets, trawl

Tucker, John W., Jr., "Energy utilization in bay anchovy, *Anchoa mitchilli*, and black sea bass, *Centropristis striata striata*, eggs and larvae," 279

Tuna
larvae abundance, 976

Tuna, albacore
feeding habits, 275

Tuna, bluefin
habitats, 615

Tuna, yellowfin
catch rates, 123

"Tuna larvae abundance: comparative estimates from concurrent Japanese and Australian sampling programs," by Tim L. O. Davis, Greg P. Jenkins, Mori Yukinawa, and Yasuo Nishikawa, 976

United States markets
sablefish, 341

Utter, F., G. Milner, G. Stahl, and D. Teel, "Genetic population structure of chinook salmon, *Oncorhynchus tshawytscha*, in the Pacific Northwest," 239

Uzmann, Joseph R.—see Langton and Uzmann

Vecchione, Michael, and Victoria A. Hand, "Digestive-gland histology in paralarval squids (Cephalopoda: Loliginidoe)," 995

VERB—see Bongo net

Vertebrae studies
marlin, Pacific blue, 829

Vidal, Omar, and Gary Pechter, "Behavioral observations on fin whale, *Balaenoptera physalus*, in the presence of killer whale, *Orcinus orca*," 370

Visual acuity
seabass, white, 542

Vital rates—see Growth rates

Vlymen, Lillian L., "Reuben Lasker: A remembrance 1929-1988," 376

Vulnerability—see Mortality rates

Waltz, C. Wayne—see Collins et al.

Watanabe, Y.—see Owen et al.

Watanabe, Yoshiro, and Nancy C. H. Lo, "Larval production and mortality of saury (*Coloabis saira*) in the northwestern Pacific Ocean," 601

Watanabe, Yoshiro—see Theilacker and Watanabe

Watson, William, and Raymond L. Davis, Jr., "Larval fish diets in shallow coastal waters off San Onofre, California," 569

Watson, William—see Stevens et al.

Weakfish
economic value, 223
population studies, 205

Weather effects—see Habitat effects

Wenner, Charles A.—see Wenner and Wenner

Wenner, Elizabeth L., and Charles A. Wenner, "Seasonal composition and abundance of decapod and stomatopod crustaceans from coastal habitats, southeastern United States," 155

Wespestad, Vidar—see Moksness and Wespestad

Whale, fin
behavioral studies, 370

Whale, killer
behavioral studies, 370

Whiting, Pacific
predatory studies, 633

Wilkinson, J. R.—see Ohman and Wilkinson

Williams, Austin B., and Keiji Baba, "New squat lobsters (Galatheidae) from the Pacific Ocean: Mariana Back Arc Basin, East Pacific Rise, and Cascadia Basin," 899

Williams, Austin B., and C. Allan Child, "Comparison of some genera and species of box crabs (Brachyura: Calappidae), southwestern North Atlantic, with description of new genus and species," 105

Williams, Happy A.—see Ralston and Williams

Wilson, C. D.—see Pearcy et al.

Wilson, Charles A.—see Beckman et al.

Witzell, W. N., "Longbill spearfish, *Tetrapturus pfluegeri*, incidentally caught by recreational billfishermen in the western north Atlantic Ocean, 1974-86," 982

Wroblewski, J. S., James G. Richman, and George L. Mellor, "Optimal wind conditions for the survival of larval northern anchovy, *Engraulis mordax*: a modeling investigation," 387

Yamashita, Yoh, and Kevin M. Bailey, "A laboratory study of the bioenergetics of larval walleye pollock, *Theragra chalcogramma*," 525

"Yellowfin tuna, *Thunnus albacares*, catch rates in the western Pacific," by Tom Polacheck, 123

Yoklavich, Mary M., and Ellen K. Pikitch, "Reproductive status of dover sole, *Microstomus pacificus*, off northern Oregon," 988

Yoklavich, Mary M.—see Boehlert et al.

Yukinawa, Mori—see Davis et al.

Zamora, Gilbert, Jr.—see Sheridan et al.

Zooplankton
  abundance, 675
  biomasses, 633
  population studies, 967

Zostera marina—see Eelgrass